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Last mile load carrier

Devtanu Bose
devtanubasu@gmail.com
Amity University, Kolkata, India

ABSTRACT
To develop a 1.5 Tonner last mile load carrier for the Indian market with a price range of 5-10 Lakhs.

Keywords— *Load carrier*

1. COMPETITOR BENCHMARKING

1.1 Tata Ace

Fig. 1: Tata Ace

- Engine Tata 475 TCIC (BSIII)
- Engine capacity 1405 cc
- Max engine output 70 hp @ 4500 rpm
- Max engine torque 13.8 kg·m @ 2500 rpm
- Clutch and transmission Clutch Single plate dry friction diaphragm type
- Gearbox Synchromesh 5+1
- Steering Power assisted hydraulic Rack & pinion
- Suspension
  - Front: MacPherson strut with anti-roll bar
  - Rear: Leaf Spring with Telescopic Shock absorber
- Brakes
  - Front "Hydraulic dual circuit, vacuum assisted, automatic wear adjuster Disc brake"
  - Rear Drum Brakes
- Wheels & Tyres Tyres 165 R14 & 175 LT 8PR
- Dimensions
  - Wheelbase 2380 mm
  - Width 1565 mm
  - Length 4340 mm
  - height 1858 mm

1.2 Ashoke Leyland Dost

Fig. 2: Ashoke Leyland Dost

Cylinders	**1478CC**
Capacity	**Turbo Charge Common Rail**
Engine Type	**157.5Nm@2400RMP**
Max Torque	**42.51KW @3300RPM**
Max Output	**Single plate dry friction diaphragm**
Clutch	**Manuel**
gear box	**Front: Ventilated Disc**
Brakes	**Rear : Drum**
Cargo Box Dimension	**2500X1620X270**
GVW	**2850Kg**
Payload	**1600Kg**
Fuel Capacity	**40L**
Millage	**17.6KMPL**
Price	**4.88 Lakhs**

2. MARKET TRENDS

- Freight Transport market in India is expected to be worth US$ 307.70 Billion by 2020.
- In India road freight constitutes of 2.2 million heavy duty trucks and 0.6 million light duty trucks.
- 60% of the goods in India are transported by road.
- Intra city shipment is dominated by light duty trucks like Tata Ace, Bolero Pickup and Ashok Leyland's Dost.
- These trucks hold 61% of sales shares in the Indian Truck market.

3. TECHNOLOGY OPTIONS CONSIDERED

3.1 Emission Control

- SCR (Selective Catalytic Reduction)
- Exhaust gas recirculation

3.2 Braking system

- Air disc brake
- Overrun brake (Trailer)

3.3 On Board Diagnosis System

- Crank speed sensor
- Cam speed sensor
- Coolant temperature sensor
- Oil temperature and pressure sensor
- Rail pressure sensor
- Boost temperature and pressure sensor

3.4 Stability

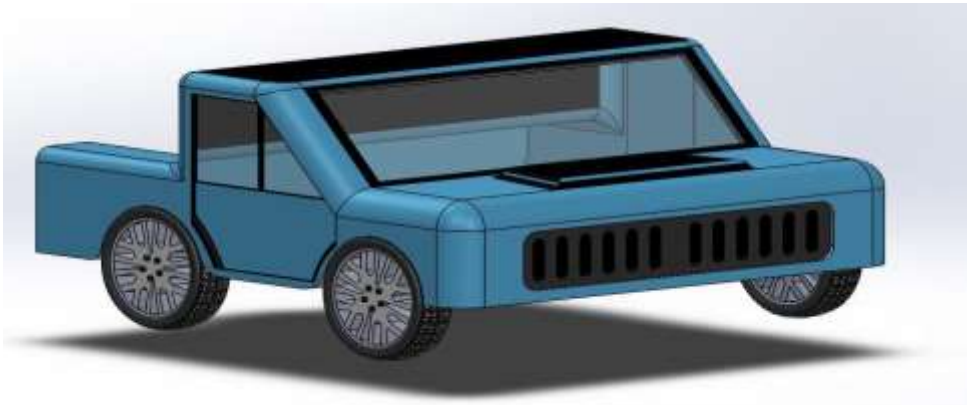
- Shocks
- Springs
- Stabilizer Bars (Suspension)
- Strut Tower Brace(Suspension)

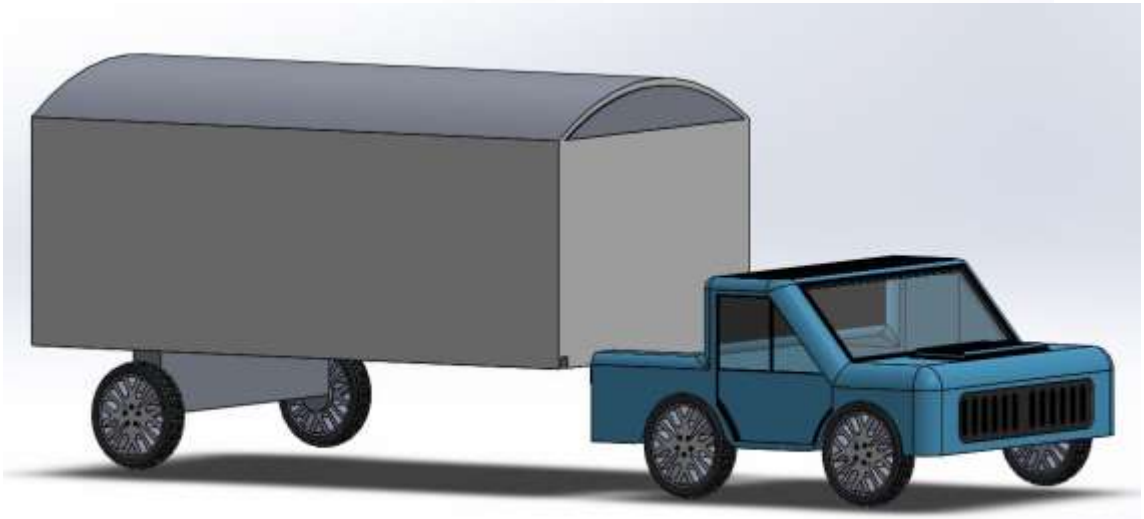
4. ERGONOMIC TECHNOLOGY OPTIONS CONSIDERED

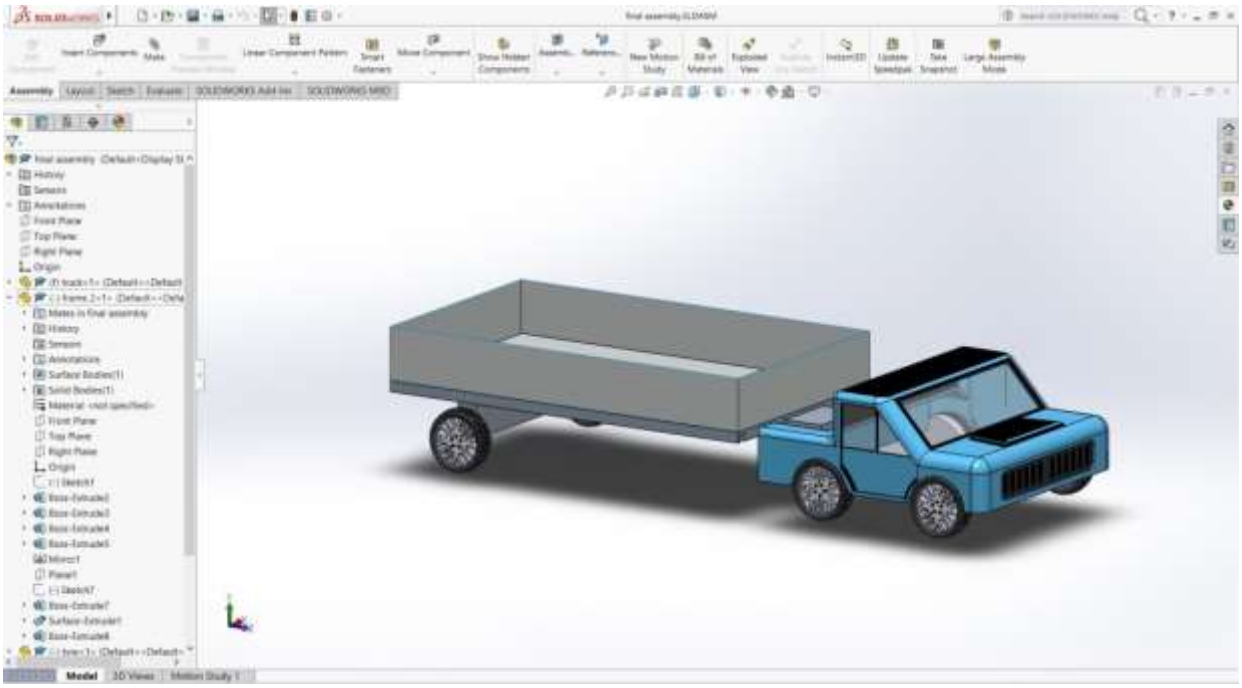
4.1 The Bosch Electronic stability control (ESP)

- In spite of improvements in passive safety and efforts to alter driver behavior, the absolute number of highway fatalities in 2002 increased to the highest level since 1990 in the US.
- ESP is an active safety technology that assists the driver to keep the vehicle on the intended path and thereby helps to prevent accidents. ESP is especially effective in keeping the vehicle on the road and mitigating rollover accidents which account for over 1/3 of all fatalities in single vehicle accidents.
- In 1995 Bosch was the first supplier to introduce electronic stability control (ESC) for the Mercedes-Benz S-Class sedan. Since then, Bosch has produced more than 10 million systems worldwide which are marketed as ESP - Electronic Stability Program.

4.2 Solution of the Problem







5. SWOT ANALYSIS

5.1 Strengths

- User Friendly
- Unique Design
- Large Load carrying space
- State of the art braking system
- Ergonomically optimized
- Spacious Cabin
- Low emission rate of NOx

5.2 Weakness

- Relatively Higher Cost.
- Turning radius is greater due to separate load carrier.
- Increased dependency of the driver on Electronic stability control.

5.3 Opportunities

- Logistic management companies.
- Two separate load carrying variants.
- Could be a revolution in the last mile carrier vehicle industry.
- The cabin is also individually available for sale.

5.4 Threat

- The design is very unique for the Indian market but customer acceptation would take a while.
- The companies would have to purchase the cabin and the load carrier separately.

5.5 Costing Analysis

- Total Cost Price: Rs 6,40,000 (Basic Variant), Rs 7,10,000 (Full Shell Variant)
- Diagnosis System: Rs 35,000
- Ergonomic design cost: Rs 10,000
- Cabin Suspension: Rs 15,000
- Exhaust gas recirculation system: Rs 10,400
- Overrun Brakes: Rs 12,000
- Brake Controller: Rs 10,000
- Air Brakes: Rs 3000
- ESC System: Rs 15,000
- Engine: Rs 1,50,000
- Tyre Cost (6 Tyres): Rs 30,000
- Chasis material + Fabrication cost: Rs 1,50,000
- Lights and Electrical systems cost: Rs 70,000
- Total Cabin Price: Rs 5,10,000
- Carrier Price: Rs 1,30,000 , Full Shell Carrier Price: Rs 2,00,000

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